Snow Coverage Area for the Sierra Nevada –February 28, 2007

The following analysis of **S**now **C**overed **A**rea (SCA) is derived from MODIS (Moderate Resolution Imaging Spectroradiometer) aboard NASA's Terra and Aquas satellites. Data from MODIS are processed to provide a resolution of 500 meters and a fractional SCA product where each pixel can range in value between 0 and 100% (e.g. 50%=50% of the 500 meter pixel is covered by snow) as opposed to the operational binary product that defines a pixel as either snow or snow free. The MODIS SCA product is available on a daily basis, but viewable areas are subject to cloud cover. In addition, tree canopies mask a portion of the SCA and should be viewed accordingly based on the vegetation characteristics of each hydrologic unit and watershed.

This analysis covers the Sierra Nevada and various river basins, with Figure 1 highlighting the SCA over the Sierra Nevada and Figure 2 showing the change in SCA between January 30, 2007 and February 28, 2007. Figures 3 (a-d) focus on the **American, Tuolumne, Merced, and Kaweah** River basins. Additional basins will be added throughout the year. ***Finally, it should be noted that SCA is most likely underestimated because of the extensive cloud cover throughout California in the last week of February.***

These data and analysis are made available by the University of California, Merced, University of California, Santa Barbara, and the National Snow and Ice Data Center (University of Colorado, Boulder) under *NASA Grant NNG04GC52 (REASoN CAN 'Multi-resolution snow products for the hydrologic sciences').* For further information or comments/suggestions please contact Robert Rice (rrice@ucmerced.edu or (209)228-4397) or Roger Bales at University of California, Merced.

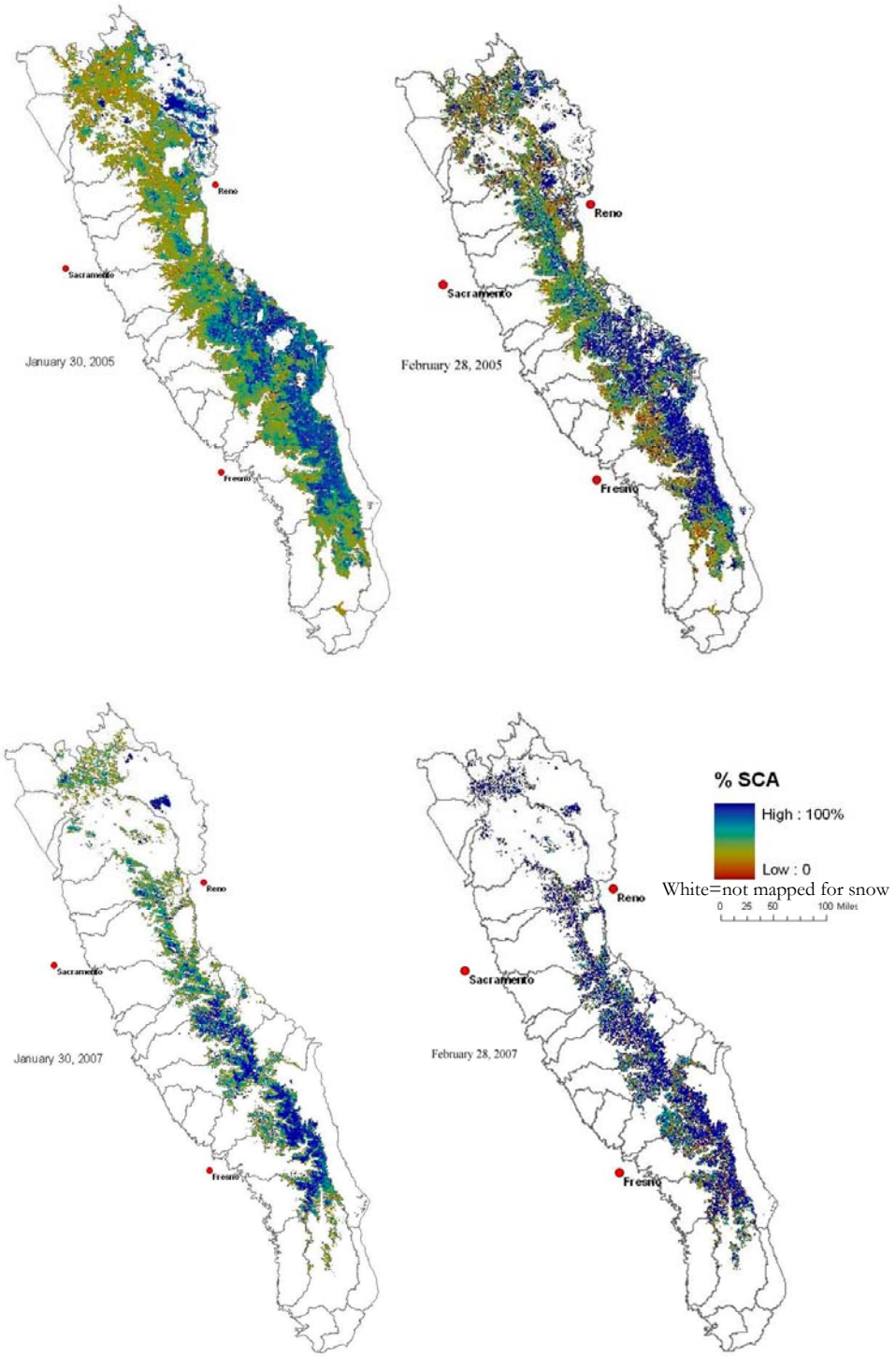


Figure 1. SCA over the **Sierra Nevada** on January 30 and February 28, 2005 and January 30 and February 28, 2007 outlined by the individual watersheds. Evident is the extent of snow cover between January and February of 2005 and 2007 in which the statewide snow water equivalent (SWE) on March 1, 2007 was 68% of the historical March 1 average (based on snow course date), while the March 1, 2005 was 135% of the March 1 average.

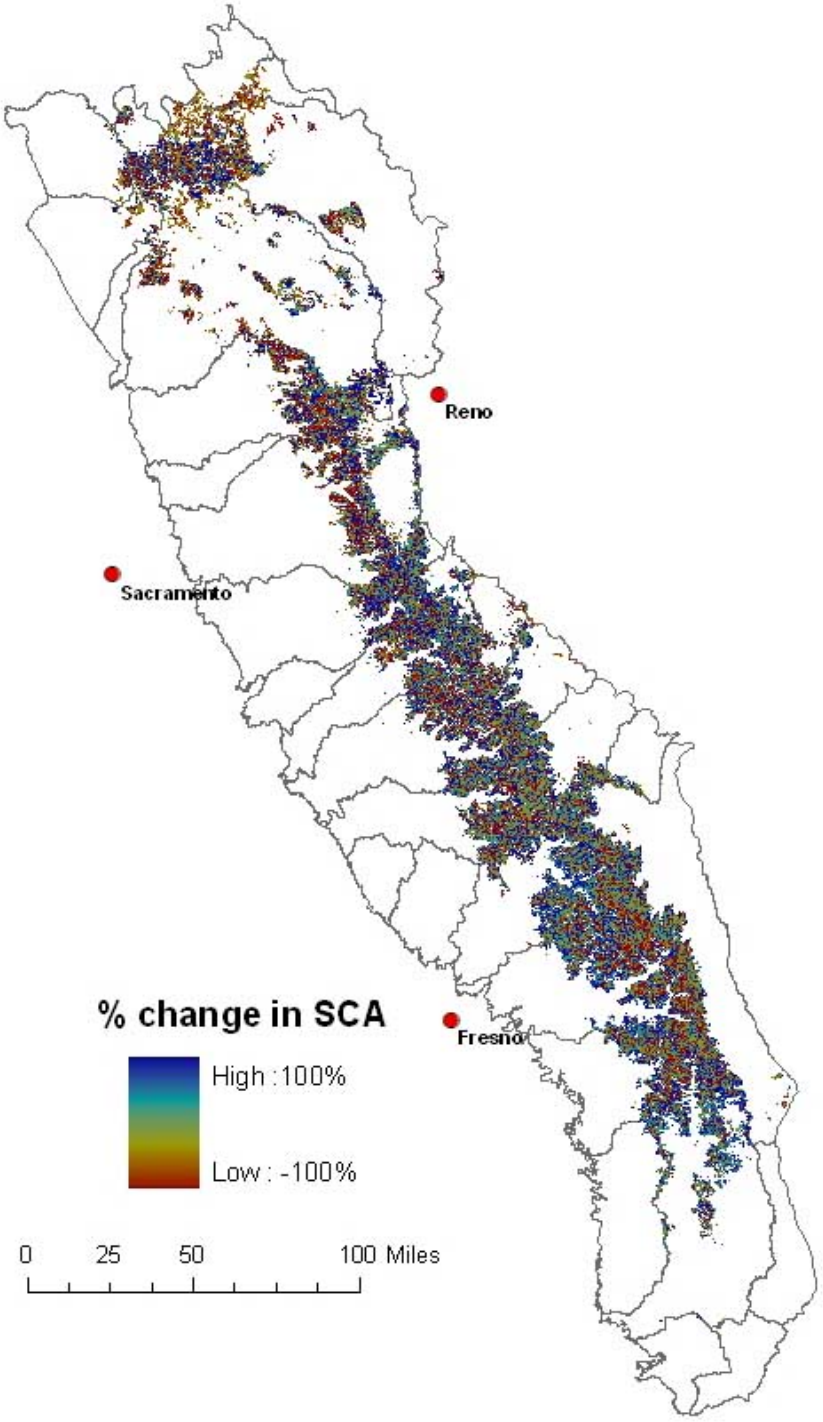
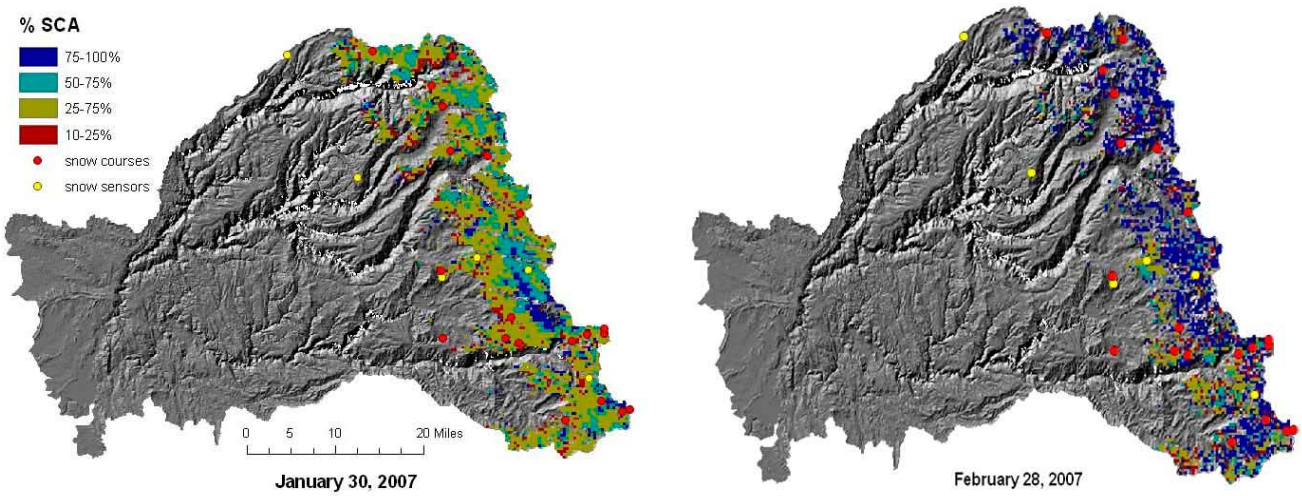
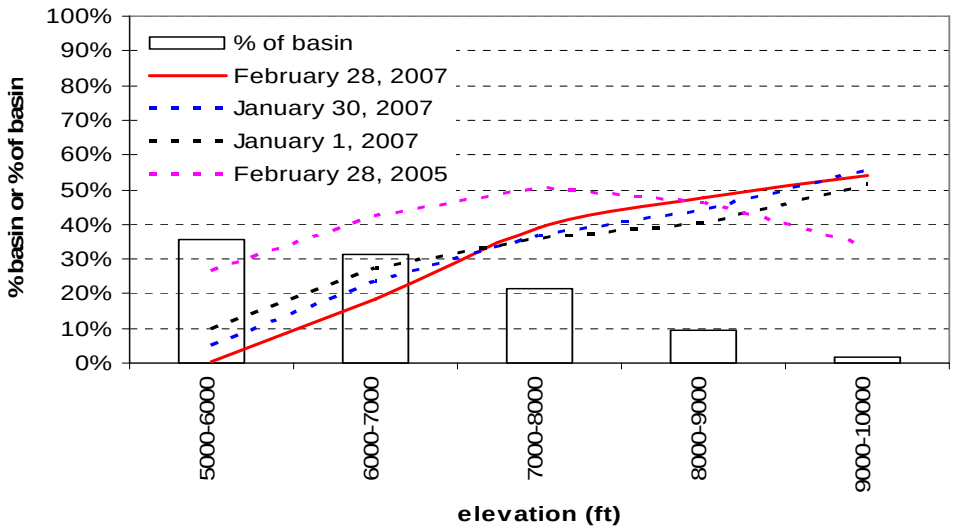


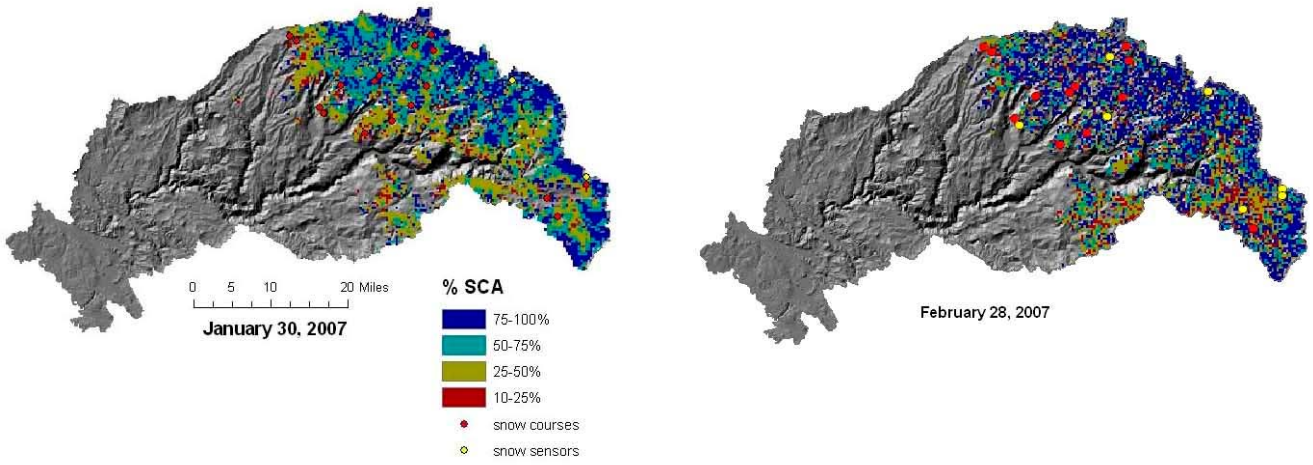
Figure 2. The graphic shows the change in SCA between January 30 and February 28 2007 in which 100% represents an increase in SCA and -100% represents a decline in SCA across a 500meter pixel.

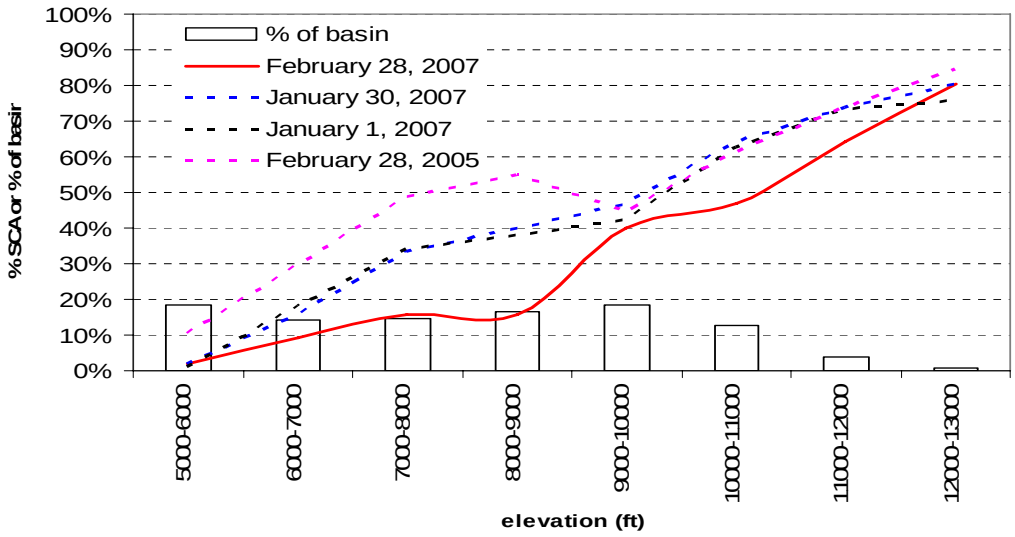




	February 28, 2007	January 30, 2007	January 1, 2007	February 28, 2005
5000-6000	0%	5%	10%	27%
6000-7000	19%	24%	27%	43%
7000-8000	39%	37%	36%	51%
8000-9000	47%	44%	40%	46%
9000-10000	54%	56%	52%	34%

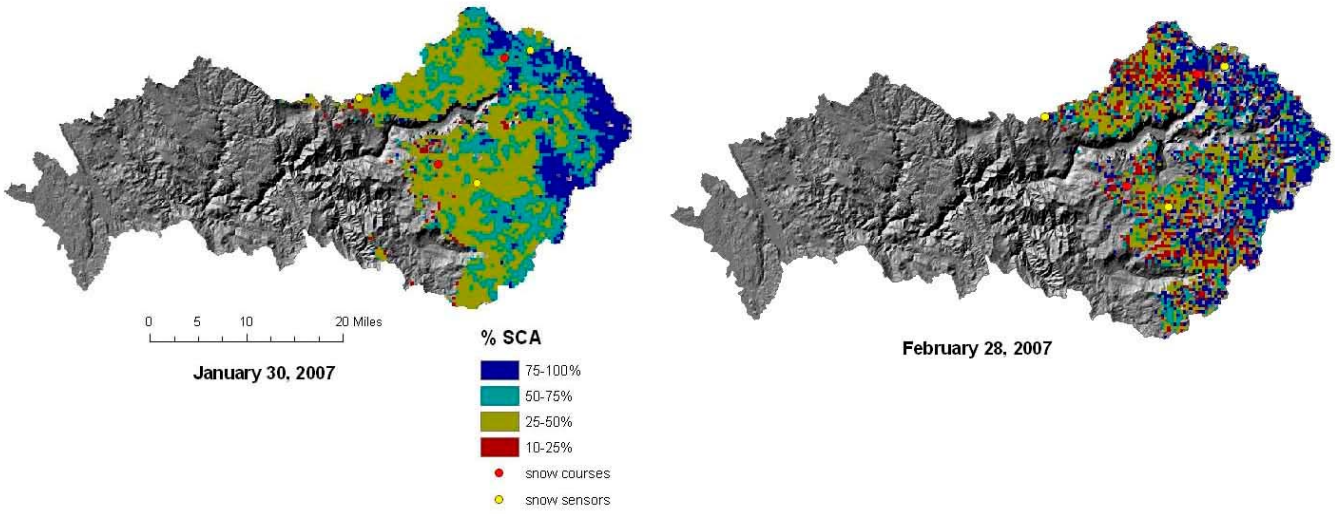
Figure 3(a). SCA over the **American River** Basin on January 30 and February 28, 2007. On February 1, 2007 basin-wide SWE was 38% of the February 1 historical average (based on basin-wide snow course data), while March 1, 2007 was 76% of the March 1 historical average. In addition, on March 1, 2005, SWE was 141% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the American River Basin from January and February 2007 and February 28, 2005.

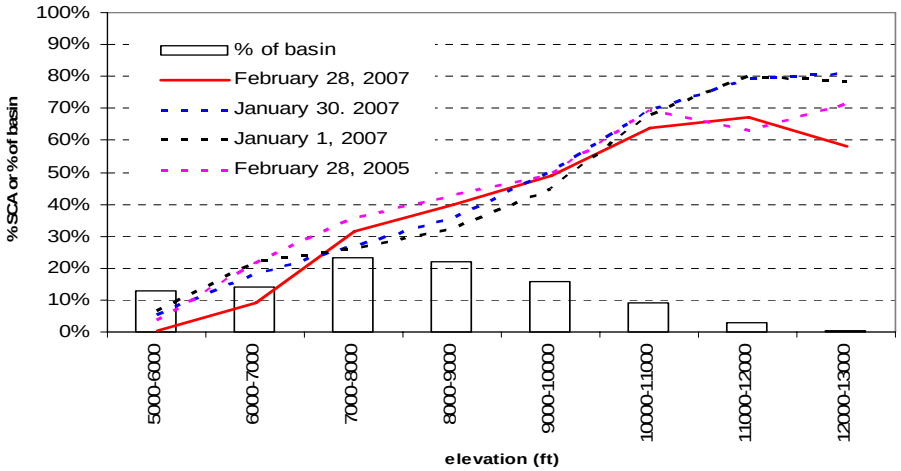




	February 28, 2007	January 30, 2007	January 1, 2007	February 28, 2005
5000-6000	2%	2%	1%	11%
6000-7000	9%	16%	18%	30%
7000-8000	16%	34%	34%	49%
8000-9000	16%	40%	38%	55%
9000-10000	40%	47%	42%	45%
10000-11000	47%	64%	63%	62%
11000-12000	64%	74%	74%	74%
12000-13000	80%	80%	76%	85%

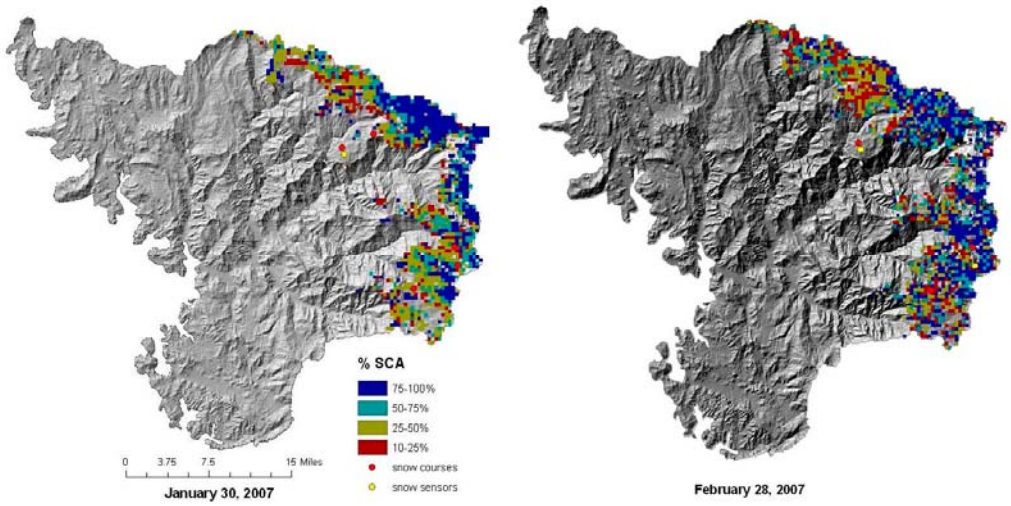
Figure 3(b). SCA over the **Tuolumne River** Basin on January 30 and February 28, 2007. On February 1, 2007 basin-wide SWE was 43% of the February 1 historical average (based on basin-wide snow course data), while March 1, 2007 was 63% of the March 1 historical average. In addition, on March 1, 2005, SWE was 153% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Tuolumne River Basin from January and February 2007 and February 28, 2005.

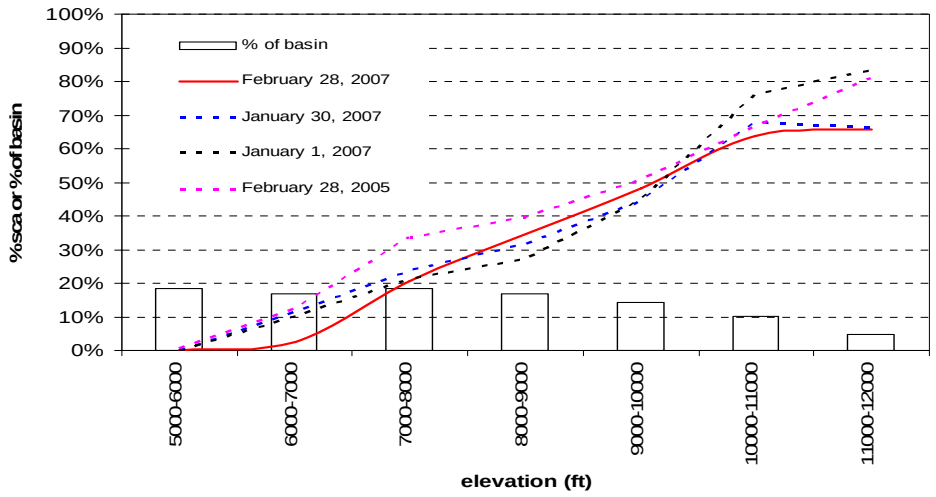




	February 28, 2007	January 30, 2007	January 1, 2007	February 28, 2005
5000-6000	0%	6%	7%	4%
6000-7000	9%	18%	22%	21%
7000-8000	31%	27%	26%	36%
8000-9000	40%	36%	32%	43%
9000-10000	49%	50%	45%	49%
10000-11000	64%	69%	68%	69%
11000-12000	67%	79%	80%	63%
12000-13000	58%	81%	78%	71%

Figure 3(c). SCA over the **Merced River** Basin on January 30 and February 28, 2007. On February 1, 2007 basin-wide SWE was 41% of the February 1 historical average (based on basin-wide snow course data), while March 1, 2007 was 66% of the March 1 historical average. In addition, on March 1, 2005, SWE was 146% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Merced River Basin from January and February 2007 and February 28, 2005.





	February 28, 2007	January 30, 2007	January 1, 2007	February 28, 2005
5000-6000	0%	0%	0%	1%
6000-7000	2%	11%	10%	12%
7000-8000	21%	24%	21%	34%
8000-9000	35%	32%	27%	40%
9000-10000	48%	44%	45%	51%
10000-11000	64%	68%	76%	67%
11000-12000	66%	66%	84%	81%

Figure 3(d). SCA over the **Kaweah River** Basin on January 30, 2007 and February 28, 2007. On February 1, 2007 basin-wide SWE was 43% of the February 1 historical average (based on basin-wide snow course data), while March 1, 2007 was 86% of the March 1 historical average. In addition, on March 1, 2005, SWE was 152% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Kaweah River Basin from January and February 2007 and February 28, 2005.